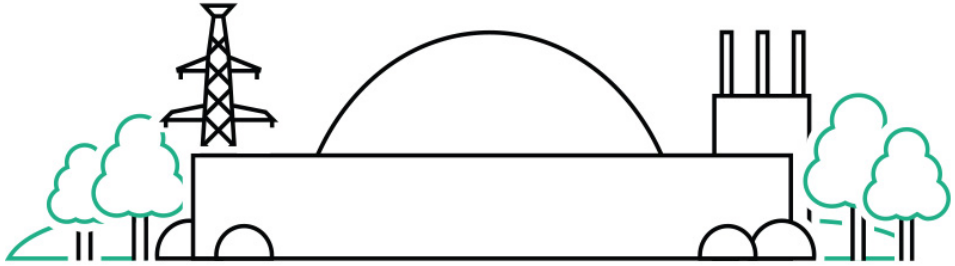
Office for Nuclear Regulation

ONR NGO Forum

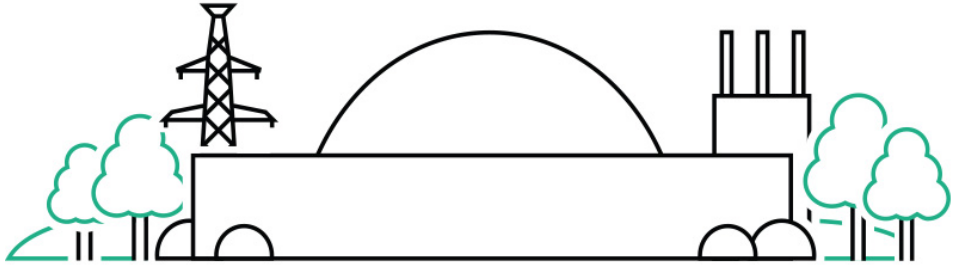
Virtual

20 November 2024



Office for Nuclear Regulation

Welcome, introductions and matters arising



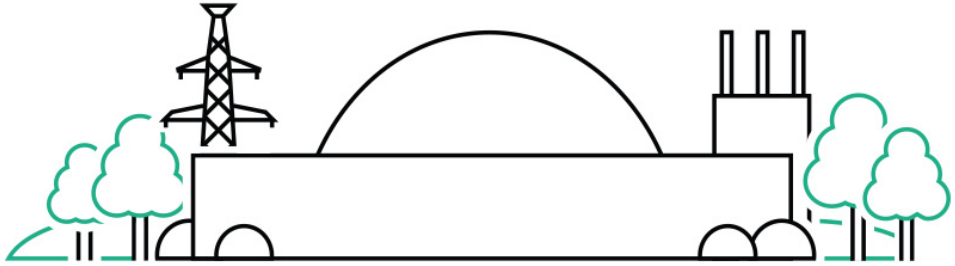
Agenda

1.0	1000 – 1005	Welcome / introductions and matters arising	David Cullen Rachel Grant
2.0	1005 – 1045	Update from ONR Chief Executive and Chief Nuclear Inspector • ONR senior team changes • CNI annual report – key findings • Sellafield • Challenges to nuclear safety from armed conflict (20 minute presentation followed by 20 mins Q&A)	Mark Foy (David Cullen to Chair)
3.0	1045 – 1115	ONRs current and future role in planning	Al Hillery
4.0	1115 – 1125	Refreshment break	All
5.0	1125 – 1155	How we regulate SMRs	Rob Exley
6.0	1155 - 1205	Update on recently concluded climate change workshops	Katy Attwater Sarah Brown
7.0	1205 - 1220	Development of ONR's strategy 2025-2030 – how can NGOs get involved?	Sarah Brown
8.0	1220 - 1225	AOB	All
9.0	1225 – 1230	Summary and close	David Cullen Rachel Grant

Office for Nuclear Regulation

Update from ONR Chief Executive and Chief Nuclear Inspector

Mark Foy



Regulatory Update

Senior Leadership Team Changes

- Finance Director – Linda Aylmore
- Senior Director of Regulation – Paul Fyfe
- Technical Director – Shane Turner
- CNI Special Advisor – Donald Urquhart

Current Recruitments

- HR Director – Recruitment ongoing, interviews before Christmas
- Permanent Chair – Interviews held, appointment in next month or so, first Board meeting February 2025
- CE/CNI – Advertisement closed last week, interviews in early January, will be a transition period

Office for Nuclear Regulation

Senior Leadership Team

Mark Foy
Chief Executive and Chief Nuclear Inspector

Paul Fyfe
Senior Director of Regulation

Sarah High
Deputy Chief Executive

Jane Bowie
Director of Regulation – New Reactors

Paul Dicks
Director of Regulation – SDFW

Dan Hasted
Director of Regulation – Operating Facilities

Shane Turner
Director of Regulation – Technical Directorate

Rachel Grant
Strategy and Corporate Affairs Director

Dave Caton
HR Director

Simon Coldham
Chief Information Officer

Linda Aylmore
Finance Director

Donald Urquhart
CNI Special Advisor

Dan Harte
CISO

———— Reports to...

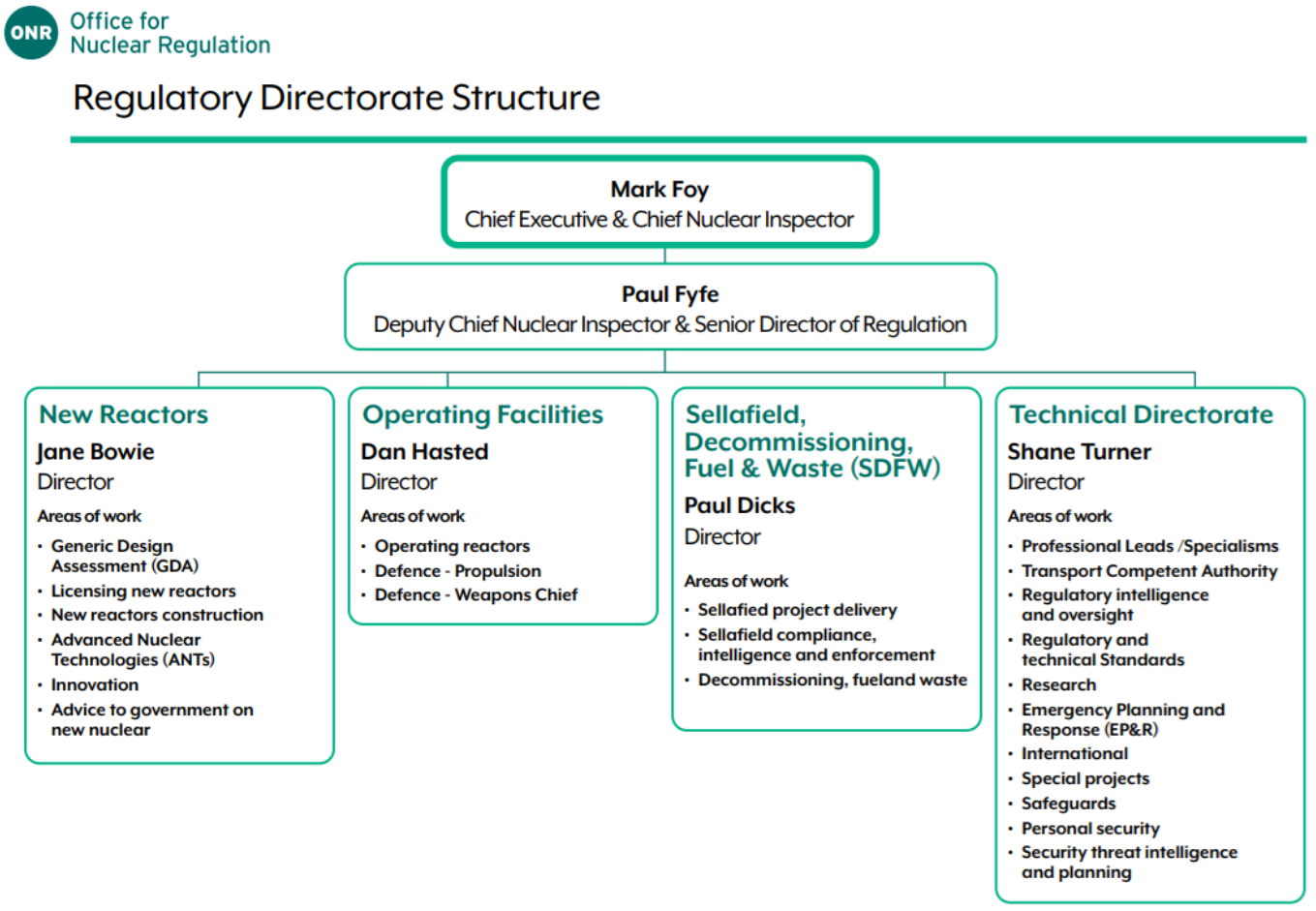
- - - - - - - - - Line manager of...

SDFW - Sellafield, Decommissioning, Fuel & Waste

CISO - Chief Information Security Officer

October 2024

Regulatory Structure



What about ONR?

2024 - 10th Anniversary since our vesting

- Celebration all staff event in June
- We have come a long way – Much changed
- Growth – People, purposes, culturally
- Modernised – Governance, processes, regulation, IT systems
- Enabling regulation philosophy! – Major step
- The experience of ONR is very different for stakeholders
- Achieved a lot - Positive influence & contribution across our purposes, with all stakeholders
- Peer reviews and actively seek feedback to learn and improve

CNI Annual Report 2024

Our Judgement

"… **overall performance** of the nuclear industry in 2023/24 **remained satisfactory**

"… inspections confirming **good levels of compliance**

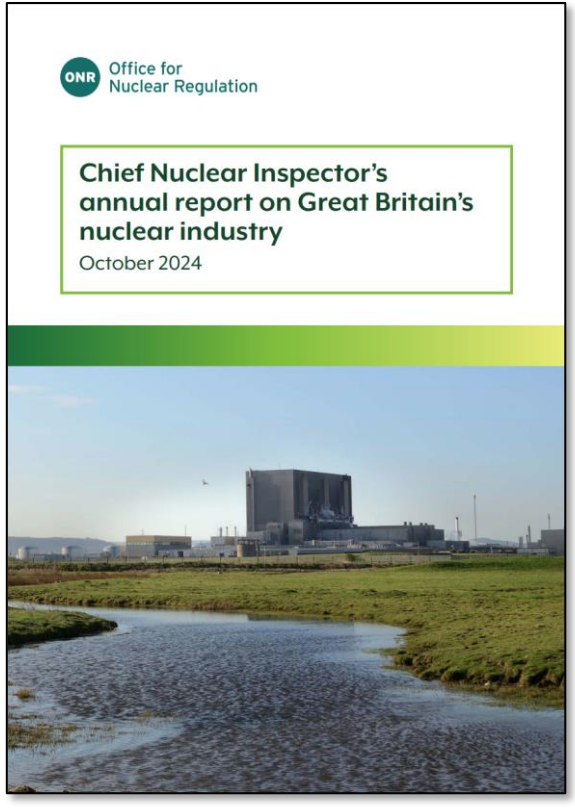
"… on the whole, the **industry continues to meet the high standards** of safety, security, and safeguards

"… **steady improvements** at sites under enhanced and significantly enhanced attention

"... **work and effort invested** to influence improvements

"… **some variations** in performance

"… **small increase** in higher significance events



CNI Annual Report 2024

CNI report themes - Continue

1. Strategic approach to nuclear site health and safety
2. Cyber security

Regulatory priorities

- Promote improvement at sites in enhanced attention
- Address legacy risks – ponds and silos, SNMs
- Enabling major infrastructure project delivery
- Industry whole lifecycle planning and management
- Risk informed and targeted engagements (RITE)
- Building/maintaining regulatory capacity & capability

CNI Annual Report 2024

Significantly Enhanced Attention Sites

Nuclear Safety – Sellafield Ltd (Analytical Services, FGMSP, MSSS, PFCS and SNM Facilities)

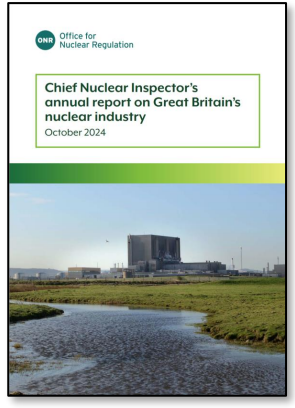
Nuclear Security – EDF NGL Corporate (cyber), Sellafield Ltd (cyber)

Enhanced Attention Sites

Nuclear Safety – Dounreay Ltd, Sellafield Ltd remainder of the site, Devonport Royal Dockyard Ltd, AWE Aldermaston

Nuclear Security – Berkley, Sellafield Ltd (Protective), Springfields

Nuclear Safeguards – All routine attention

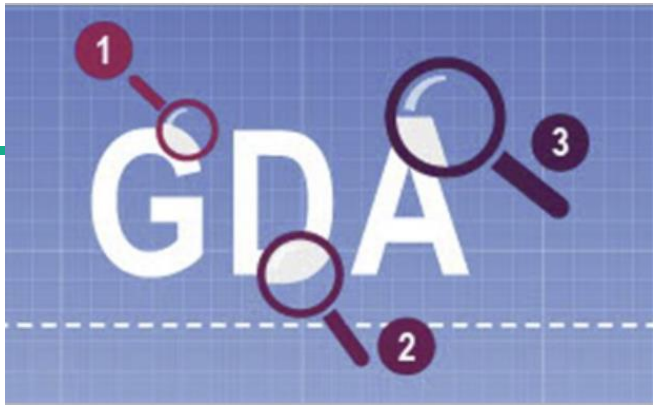


Regulatory Update

Sellafield

- Appointment of Euan Hutton as new CEO of Sellafield Ltd
- ONR content with range of senior level changes on the site
- Sellafield Ltd Cyber Security Prosecution – Sellafield Limited was fined a total of £332,500 for cyber security shortfalls
- Sellafield Ltd – Delivering cyber security improvement plan
- Re-commitment and re-energising of the G6 approach
- Consider opportunities to improve deliver across key projects on the site

Regulatory Update



GDA

- Developed by ONR and the EA
- Not a legal requirement
- De-risks entry into the formal statutory regulatory framework
- Good cooperation between ONR, EA and NRW
- Scope covers safety, security and environmental protection
- Enables the early assessment of new nuclear reactor design
- ONR can influence the right standards of safety and security at the design stage

It is not approval to build a reactor!

Regulatory Update

Nuclear Site License

- NSL granted to a body corporate
- Prescribed activity
- On a defined site
- 36 standard Licence Conditions attached

ONR needs to be satisfied the corporate body can appropriately discharge the legal duties and responsibilities of being a nuclear site licensee

Requires extensive interaction between prospective licensee and ONR

Scopes operator capacity and capability to fulfil duties under Site Licence,

LC compliance arrangements in place

Security of tenure of the land

Regulatory Update

Site Licensing cont.

- Granting a NSL does not give permission for the start of nuclear safety related construction
- Regulatory permission – Using powers under the NSL, dependent on the site-specific pre-construction safety case and organisations development
- Scopes the procurement, construction, installation and commissioning phases of the new reactor build

Regulatory Update

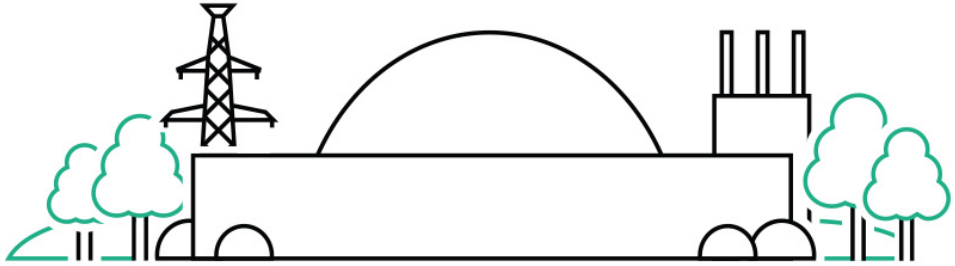
Other areas of interest

- **Hinkley Point C** – ONR Response to NNB GenCo Ltd - Detailed review into the impact of our regulation on the design evolution of the UK EPR, a robust position
- **Spending Review –** ONR input into the process
- **Artificial Intelligence** – Trilateral report ONR/US NRC/CNSC
- **Legislative reviews on going** - NISR and Nuclear Safeguards Regulations
- **BAE Systems Marine, Barrow** – Fire at the end of October
- **Challenges to nuclear safety from armed conflict** – CNI visit to Ukraine

Office for Nuclear Regulation

ONR's current and future role in planning

Al Hillery, Deputy Director, Technical Directorate



ONR’s current and future role in planning

- ONR’s role in land use planning and siting of new reactors
- Development on and around current nuclear sites
- ONR’s consultation criteria
- ONR’s consultation process
- Proposals for new nuclear sites
- Siting of new nuclear reactors – policy context now
- Siting of new nuclear reactors – future policy context
- Summary and questions

ONR's role in land use planning and siting of new reactors

ONR provides advice to:

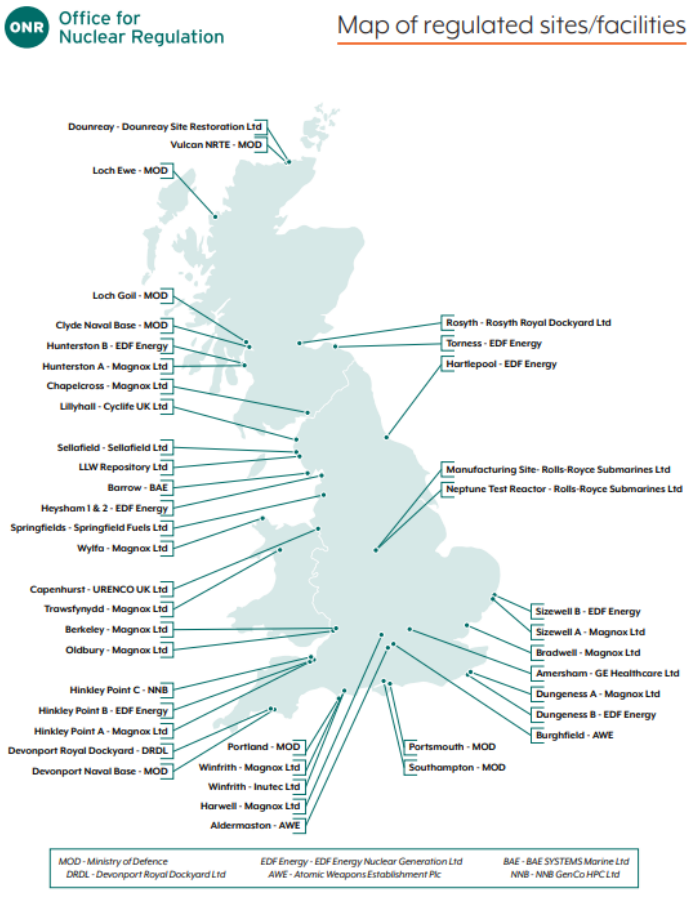
- The Planning Inspectorate (PINS), Scottish Government and Local Planning Authorities (LPAs) on development on and around existing nuclear sites; and,
- The Department for Energy Security and Net Zero (DESNZ) on proposals for new nuclear sites.

Planning Inspectorate

PlanningPortal

Scottish Government
Riaghaltas na h-Alba

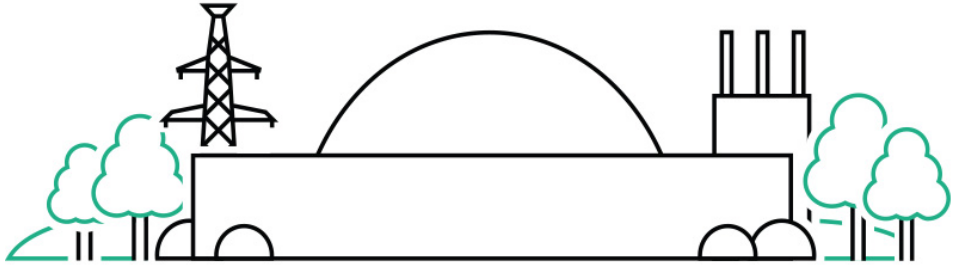
Department for Energy Security & Net Zero



Office for Nuclear Regulation

ONR's role in land use planning

Land use planning | Office for Nuclear Regulation



Development on and around current nuclear sites

- ONR provides advice on planning applications on and around nuclear sites with respect to two matters:

Development on and around current nuclear sites

Radiation (Emergency Preparedness and Public Information) Regulations (REPPIR) 2019.

- Detailed Emergency Planning Zones (DEPZ)
- On and Off-site plans in place to mitigate health consequences of significant radiological releases.

Proposed developments could impact emergency planning arrangements or pose hazards to nuclear sites (even in instances where no DEPZ are required).

ONR requests consultation on proposed developments within DEPZ and within wider consultation zones

Consultation zones

When advising on planning applications, ONR has the following consultation zones:

- On the nuclear site
- Detailed Emergency Planning Zone (DEPZ)
- Outer Consultation Zone (OCZ)
- 12km zone
- Special case

Consultation process

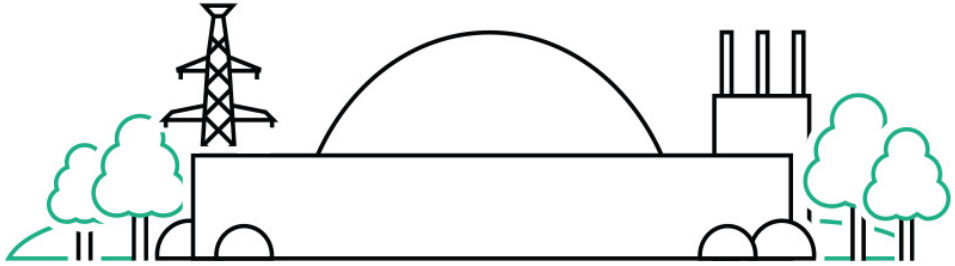
1. ONR consults with the emergency planning function within the local authority. We seek assurance that:
   - proposed developments can be accommodated within existing off-site emergency planning arrangements, or
   - off-site emergency planning arrangements can be amended to accommodate the proposed development.
2. Where the proposed development presents a potential external hazard to a nuclear site:
   - ONR will consult the licensee’s planning.
   - Provide advice to the LA on the significance of the proposal and safety on the site.

Consultation process

3. ONR will state that it **does not advise against** the proposed development on planning grounds if the following statements apply:
    - assurance provided by LA that off-site emergency arrangements (existing or amended) can accommodate the development.
    - the development does not represent an external hazard to a nuclear site.
    - the site dutyholder has demonstrated that it would not constitute a significant hazard to safety on their site.
4. ONR may provide a conditional response when it has not received a response from the local authority or licensee.
5. In all other cases, where the above statements do not apply, ONR **advises against** the proposed development.

Office for Nuclear Regulation

ONR's role in siting of new nuclear reactors

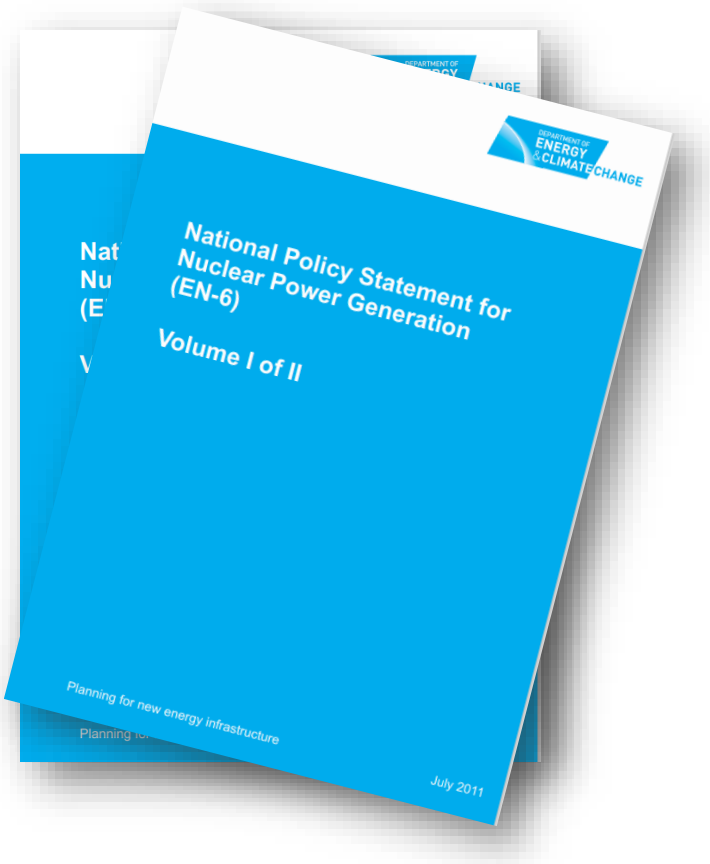


Siting of new reactors – policy context now

- Government (DESNZ) leads on the policy for siting of new nuclear power stations and defines strategic siting criteria that are applied.
- The current National Policy Statement for Nuclear Power Generation (EN-6) identifies 8 specific sites as potentially suitable for deployment of new GWe scale reactors by 2025.

The designated New Build Sites are at:

- Hinkley Point C; Sizewell C; Wylfa; Hartlepool; Oldbury; Bradwell; Heysham; and Moorside.



Siting of new reactors – policy context now

There are four principal regulatory processes applicable to deployment of a new nuclear reactors in Great Britain.

- Planning - Led by the Planning Inspectorate
- Licensing - Led by ONR
- Permitting - Led by Environment Agency
- Justification - Led by DEFRA

Proposals for new nuclear sites

- ONR provides advice to government on demographic (exclusionary) and emergency planning (discretionary) criteria.
- ONR's guidance document Land Use Planning and The Siting of Nuclear Installations (NS-LUP-GD-001) provides the basis for demographic and emergency planning assessment.

Siting of nuclear reactors – future policy context

- In January 2024 HMG launched a consultation on proposed changes to the nuclear siting policy which closed in March 2024.
- Proposal: retain EN-6 for GWe scale power reactors. Introduce a new EN-7 for Developer led siting of all fission reactors for power and direct heat generation in England (excluding research reactors).
- The siting criteria remains the same. However, under the new NPS ONR will advise PINs regarding the developer submissions under the planning regime.
- In Wales: The Infrastructure (Wales) Act (2024) is the applicable bill for the planning process for new nuclear power generating stations in Wales.

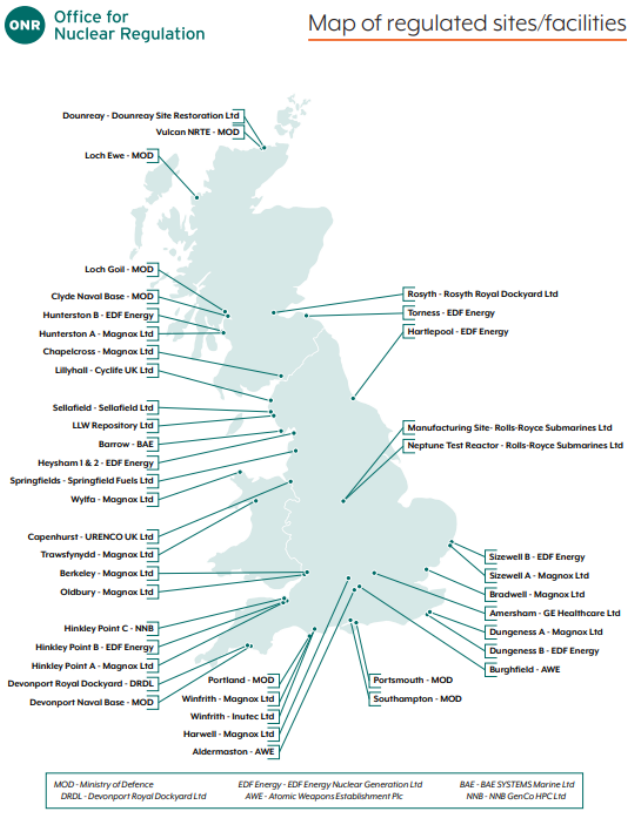
Planning versus licensing

- The new EN-7 proposals would allow a developer to identify a site or sites and apply the exclusionary criteria to the site to establish if it is potentially suitable. They would then approach PINs to open discussions on a DCO application.
- For entry into the nuclear site licensing (NSL) process ONR requires that a specific site is identified which is consistent with government siting policy – a potentially suitable site has been selected.
- Once embarked the NSL process the prospective licensee's site specific design is assessed in detail in its proposed configuration for that specific site through the submission of a Site Justification Report as part of its site licence submission dossier.

Summary

ONR provides advice to:

- The Planning Inspectorate (PINS), Scottish Government and Local Planning Authorities (LPAs) on development on and around existing nuclear sites; and,
- The Department for Energy Security and Net Zero (DESNZ) on proposals for new nuclear sites.



Planning Inspectorate

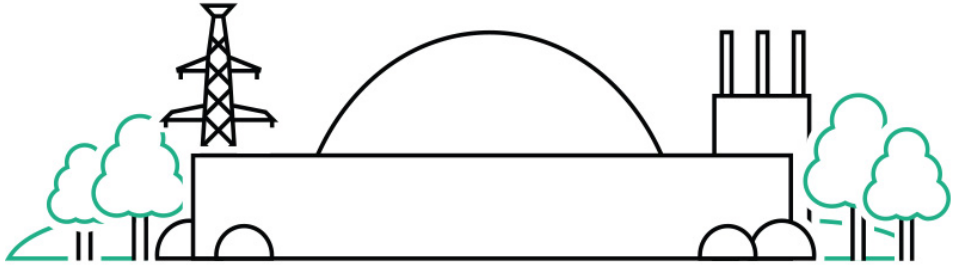
Scottish Government
Riaghaltas na h-Alba

PlanningPortal

Department for Energy Security & Net Zero

Any questions

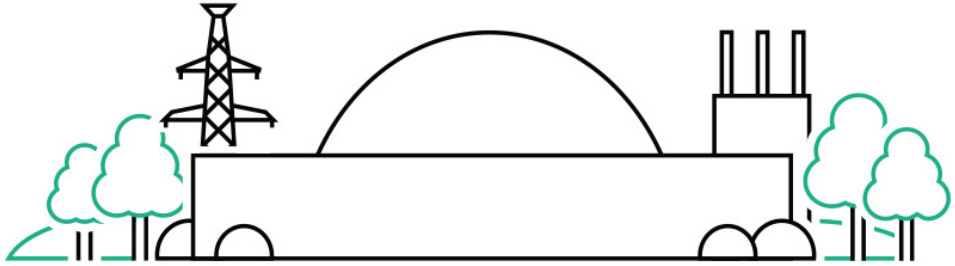
Refreshment break



Office for Nuclear Regulation

Regulation of SMRs

Robert Exley, ONR Head of Rolls-Royce SMR & BWRX-300 GDAs



Overview

- Reactor technologies
- GBN
- Projects independent of GBN’s Plans
- Regulation of SMRs and advanced reactors – formal regulation and GDA
- Status of GDAs and other engagements
- Near term challenges with SMRs
- Future challenges

Reactor technologies

- GW-scale reactors: e.g. EPR, AP1000, ABWR *what all completed GDA have considered*
- Small modular reactors: light water technologies, 300-500 MWe range. *4 designs in the GBN competition, power output similar to Magnox/AGR, footprint measured in "football stadium" units*
- Generation IV advanced reactors: dozens of different models, distinct groups/types, range of sizes (10s-100s MWe), safety claims still to be demonstrated, operational challenges to overcome.
- Micro-reactors: <10 MWe. Maybe can be transported in a few ISO containers.

Great British Nuclear (GBN)

- GBN is currently running a competition to identify which SMR technology the government should back.
- Four designs are still in contention: RR SMR, BWRX-300, AP300, SMR-300 (all LWR SMRs)
- GBN has indicated it wants to select two technologies
- It has secured two sites (Wylfa and Oldbury) from Hitachi. These sites have been chosen for their suitability for multiple units of the same technology
- GBN will not be the licensee, but will establish the “development companies” (devcos) and fund them to the point of financial investment decision (FID), with a view to investors coming in.
- Decisions expected in 2025, FID 2029/2030? Operation mid-2030s?
- ONR is not involved in technology or site selection, but we have been asked to undertake generic design assessments (GDAs) on the technologies and provide advice to GBN on the capability the devcos will need to get a nuclear site licence.

Projects independent of GBN's plans

- DESNZ has been supportive of new technologies being built in GB outside of GBN
- A number of Generation IV vendors have talked about UK plans and are engaging early with ONR:
  - NewCleo – lead fast reactor
  - X-Energy – high temperature gas reactor
  - Moltex Flex – molten salt reactor
  - TerraPower – sodium fast reactor
- Last Energy has plans for multiple units of 20 MWe PWRs

Regulation of SMRs and advanced reactors

Three main parts – the same as GW-scale

Status	Regulatory Activity	Agency (*)
Voluntary	Generic Design Assessment (GDA)	ONR & Environment Agency
Formal	Licensing Permitting Development Consent Order	ONR Environment Agency Planning Inspectorate
Formal	Construction, commissioning and operation permissioned under the site licence/permits	ONR & Environment Agency

(*) for developments in Wales, Natural Resources Wales has responsibility for permitting, supported by the Environment Agency

Voluntary Regulatory Pathways

One day meetings, technical workshops and preliminary design review

Focussed on the design of the nuclear power plant

Designed to get the applicant ready to submit a formal licence application "right first time"

Early engagement → GDA → Pre Licensing

Purpose of early engagement and GDA is to reduce uncertainty and project risk.

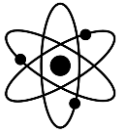
Early engagement and GDA are voluntary. A potential applicant could go straight to site licensing without undertaking either.

GDA could also be carried out in parallel with licensing.

Formal ONR regulation

Applicant submits written application to the CNI

Licence granted



Permission to proceed to key stages of construction, installation and commissioning

ONR regulates the UK's 15 civil nuclear reactors

Objective – long term protection of the public and environment

Licensing → Licence issue → Construction and Commissioning → Operation → Decommissioning

Formal ONR regulation

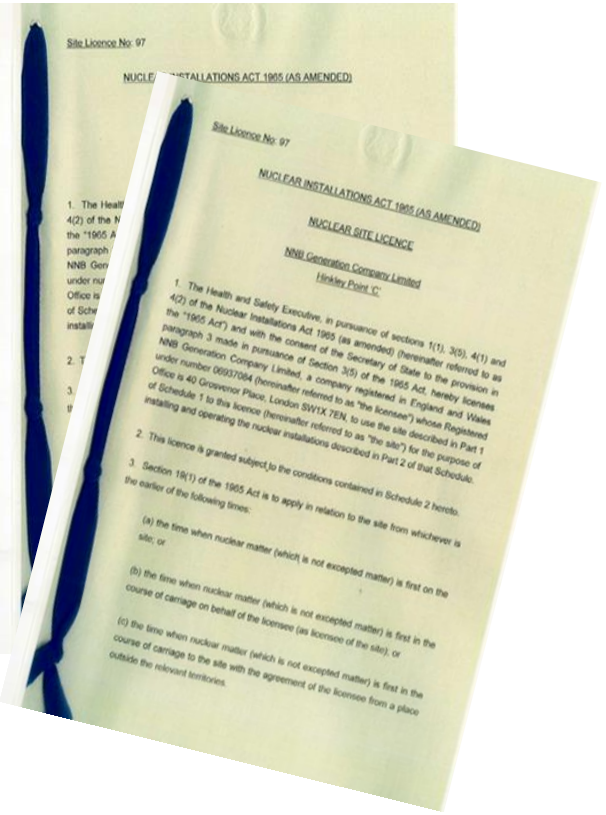
ONR grants a site licence once it is satisfied that:

A corporate body**:**

> Has the capability to conduct specified activities on an identified site subject to conditions attached to the nuclear site licence

ONR does not license the design. The licence is given to a specific UK-registered company for an identified site.

The design does not need to assessed/approved at the point of licence grant – but ONR needs to have confidence the design is suitable for site, and the licensee has the capability to build and operate the design.


Site Licence No: 97

NUCLEAR INSTALLATIONS ACT 1965 (AS AMENDED)

NUCLEAR SITE LICENCE

NNB Generation Company Limited

Hinkley Point 'C'

1. The Health and Safety Executive, in pursuance of sections 1(1), 3(5), 4(1) and 4(2) of the Nuclear Installations Act 1965 (as amended) (hereinafter referred to as the "1965 Act") and with the consent of the Secretary of State to the provision in paragraph 3 made in pursuance of Section 3(5) of the 1965 Act, hereby licenses NNB Generation Company Limited, a company registered in England and Wales under number 06937084 (hereinafter referred to as "the licensee") whose Registered Office is 40 Grosvenor Place, London SW1X 7EN, to use the site described in Part 1 of Schedule 1 to this licence (hereinafter referred to as "the site") for the purpose of installing and operating the nuclear installations described in Part 2 of that Schedule.

2. This licence is granted subject to the conditions contained in Schedule 2 hereto.

3. Section 19(1) of the 1965 Act is to apply in relation to the site from whichever is the earlier of the following times:

(a) the time when nuclear matter (which is not excepted matter) is first on the site; or

(b) the time when nuclear matter (which is not excepted matter) is first in the course of carriage on behalf of the licensee (as licensee of the site); or

(c) the time when nuclear matter (which is not excepted matter) is first in the course of carriage to the site with the agreement of the licensee from a place outside the relevant territories.

Formal ONR regulation

An ONR granted site licence has 36 standard licence conditions associated with it.

These Licence Conditions give ONR regulatory control over operations on the site.

> Licence Condition 19 – Construction or installation of new plant

Progress beyond agreed holdpoints requires regulatory approval, usually after the review of a safety case submission.

- First safety-significant construction
- Start of commissioning
- Fuel load
- Start of operations

GDA

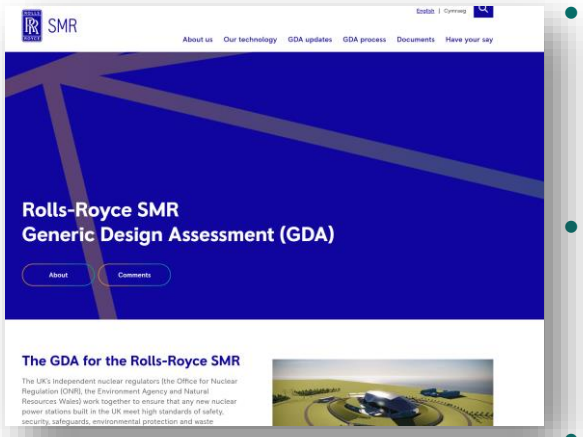
The objective for GDA is to provide confidence that the proposed design is capable of being constructed, operated and decommissioned in accordance with the standards of safety, security and environmental protection required in GB. For the RP, this offers a reduction in uncertainty and project risk regarding the design, safety, security and environmental protection cases so as to be an enabler to future licensing, permitting, construction and regulatory activities.

- ONR can interact early on the design when we can have maximum influence
- Open and transparent
- Focus on generic issues, site-specific issues addressed later
- Undertaken with the technology vendor, not waiting for a site or licensee to be in place
- Can be in parallel to selecting site, creating a licensee, funding a project – GDA is not a regulatory prerequisite but may be a commercial requirement for project backers.

GDA

- A “full” GDA is three steps
  - It is undertaken to a level equivalent to what would be needed to release the first LC19 holdpoint – first safety-significant construction
- There is an option to stop at the end of Step 2 – some of the SMR vendors have asked to do this.
  - This does not achieve the same outcome/risk reduction as the full GDA – we are not trying to achieve the same outcome in a shorter period
- The choice of two v three steps is one for the vendor and their stakeholders – what level of project risk reduction are they seeking?
  - Any SMR built will still need to go through the same formal regulatory processes. Without a full GDA, there will be more to demonstrate for the first time during formal regulation and a greater risk of delays/expensive design changes.
  - A two-step GDA is not a short cut or reduction in safety standards

GDA



- In GDA, we consider (almost) all of ONR's purposes and technical areas
- We work closely with EA on waste. EA also looks at other (generic) issues in its purposes (e.g. water abstraction)
- The vendors are required to publish their key submissions to ONR on their website and host a comments process
- ONR publishes all its assessment reports on its website https://www.onr.org.uk/generic-design-assessment/assessment-of-reactors/

Chemistry	Fault Studies	Radioactive Waste Management
Civil Engineering	Fuel and Core	Safeguards
Control and Instrumentation (C&I)	Human Factors	Security
Conventional Fire Safety	Internal Hazards	Severe Accident Analysis (SAA)
Conventional Health and Safety	Management for Safety and Quality Assurance	Spent Fuel Management
Decommissioning	Mechanical Engineering	Structural Integrity
Electrical Engineering	Probabilistic Safety Analysis (PSA)	
External Hazards	Radiological Protection	

Status of GDAs and other engagements

- The RR SMR started a full three-step GDA in April 2022. It completed Step 2 in July 2024. It is due to complete Step 3 in December 2026.
- The Holtec SMR-300 started a two-step GDA in October 2023. It completed Step 1 in August 2024. It is due to complete Step 2 in late 2025. There are no current plans for Step 3.
- The GEH BWRX-300 started a two-step GDA in January 2024. It is due to complete Step 1 in December 2024. It is due to complete Step 2 in late 2025. There are no current plans for Step 3.
- DESNZ has asked ONR to start a two-step GDA on the Westinghouse AP300. We expect to start in January 2025 and it to take ~ 2 years.
- GBN's decision making and timescales will drive which technologies and sites are selected, and when formal licensing/permissioning will commence.
- Our website summarises the early engagement activities we are undertaking (*). This includes providing "realistic" advice on the requirements for GDA and site licensing.

(*) https://www.onr.org.uk/generic-design-assessment/early-regulatory-engagement-on-new-nuclear-projects/

Near term challenges with SMRs

- The LWR SMRs currently in GDA do have some novel safety features – but all variations of concepts we have seen and assessed before (use of “passive” systems that minimise need to emergency ac power following an accident)
- The extent they are modular is largely a commercial matter to ease constructability – limited nuclear safety or security concerns so far
- The biggest challenge for ONR has been the immaturity of designs – none have been built, detailed design work is still underway
- The fuel and its disposal route are the same as operating LWRs
- They are not “small”. GBN’s plans are to build on/close to existing sites. Construction will take several years.
- SMRs may be of interest to “non-traditional” operators but not before the first units have been successfully built by eg GBN.

Future challenges

- Generation IV technologies claim to achieve the same or better levels of safety but in different (and cheaper) ways
- These claims still need to be demonstrated and assessed to the level done repeatedly for LWRs
- There is lots of international guidance and experience for LWRs, it is more limited for advanced reactors
- Every reactor design makes different safety arguments – only a small fraction will ever get built, but which ones?
- Disposals routes for the fuel and coolants will need to be demonstrated
- Some are using HALEU fuel enriched between 5-20%. The international fuel cycle industry has developed around <5%
- The proponents of these technologies are very confident but most have been tried before; many of the operational challenges faced then still need to be overcome

Conclusion

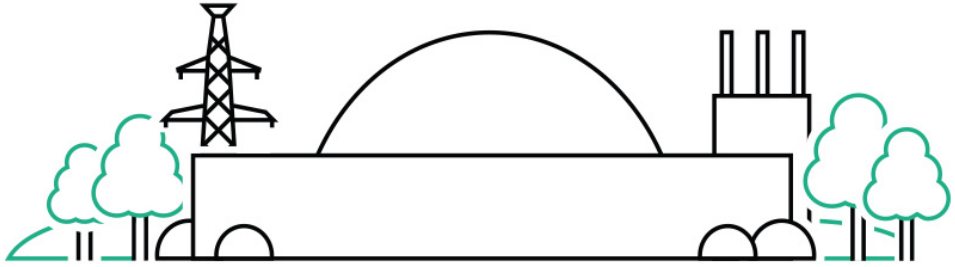
Key takeaways:

- GDA is allowing us to look in detail at SMRs and influence the safety and security of their design early – we are not waiting for site specific projects and operating companies to be established.
- [LWR] SMRs remain a significant undertaking but from a regulatory perspective the challenges are well known and will be assessed to the same level as GW-scale reactors.
- GBN is expected to drive the siting and timing of the first LWR SMRs. The size of future fleet builds and locations remains very uncertain.
- There are many types and sizes advanced Generation IV reactors. It is to be seen which will get built and what the specific challenges will be.

Office for Nuclear Regulation

Update on recently concluded climate change workshops

Katy Attwater and Sarah Brown



Sarah Brown ONR Co-Chair CC Workshop 22 October 2024

Focus on implementation and helping ONR to examine the level of visibility, openness and transparency within ONR's regulatory processes relating to climate change

- NGO attendees rated event between 8-10 out of 10
- Further workshop planned this financial year with broader focus on strategy
- Two further workshops next year to go back and continue discussion on climate change after using outputs to examine internally

Update in ONR's consideration of Climate Change (since Summer 2023)

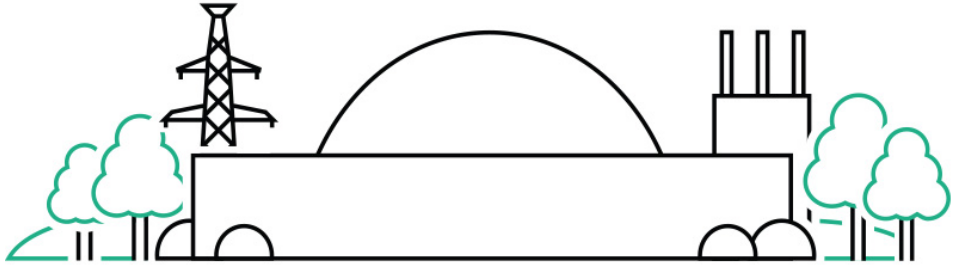
As climate change is a dynamic challenge, it should be expected that ONR's consideration of its potential effects should be regularly reviewed. Since we last met…

- Our Expert Panel, together with our Specialist Inspectors, have provided us with valuable updates upon the latest science in relation to climate change.
- We have made significant progress with the Chief Nuclear Inspector's Themed Inspection on climate change and have recently completed the site inspection phase.
- We have published updated regulatory guidance in relation to climate change.
- We have prepared a report on the GB nuclear industry in response to the 4th round of mandatory climate change adaptation reporting.

Office for Nuclear Regulation

Development of ONR's strategy 2025-2030
How can NGOs get involved?

Sarah Brown



ONR Strategy 2025 – 2030 – Key Timings

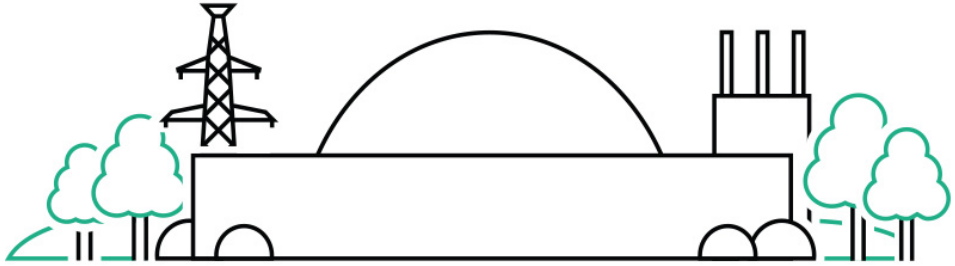
- NGO strategy workshop – Early 2025
- Formal Consultation – Late Spring 2025
- Publication Planned for October 2025

ONR Strategy 2025 – 2030 – Key Timings

Use Menti to gather your views on what you think the top three strategic objectives should be

- You will then be able to vote on the suggestions
- Visit Menti.com
- Input code – 7399 0049

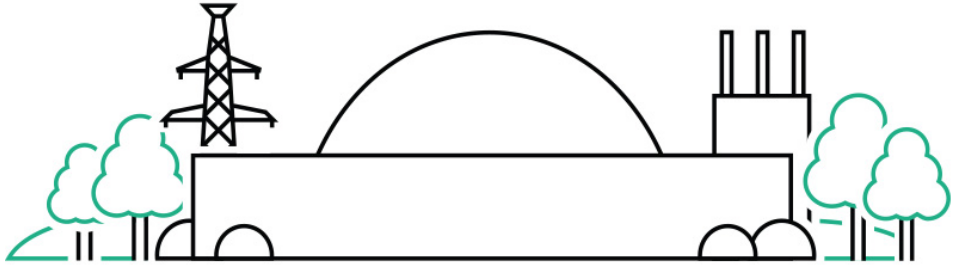
Any other business



Office for Nuclear Regulation

Summary and close

David Cullen and Rachel Grant



Feedback

NGO Online Forum - November 2024 - Feedback form

https://forms.office.com/Pages/ResponsePage.aspx?id=33UndHeA1kiB0B6CofUsuERZBzisUdtFsKe5MYsqa4dUOTZaWUhZSlRJRjROSEI4UDVYQzBVUUlFVy4u

Thank you